WHAT IS CLAIMED IS:

1. Apparatus for detecting a target hidden behind a surface, comprising:

a transmitter that transmits a beam of continuous-wave radiation;

a first receiver disposed to receive such radiation reflected from a target; and

a second receiver disposed to receive such radiation reflected from the target, wherein

the receivers are spaced from the transmitter and are spaced from one another according to predetermined spatial relationships such that the phase of reflected radiation received by the first receiver is in quadrature with the phase of reflective radiation received by the second receiver, and wherein the apparatus further comprises circuitry that combines signals derived from the receivers to produce an output.

2. Apparatus according to claim 1, wherein the output corresponds to the square root of the sum of two squared signals derived from the receivers.

3. Apparatus according to claim 1 or 2, wherein the spatial relationships are such that the receivers receive direct radiation from the transmitter before radiation reaches the target.

4. Apparatus according to claim 3, wherein the phase of direct radiation received by the first receiver is in quadrature with the direct radiation received by the second receiver.

5. Apparatus according to any preceding claim, wherein the radiation is microwave radiation and each of the transmitter and the receivers includes an antenna with a directional beam pattern.

6. Apparatus according to claim 5, wherein the spatial relationships are such that the beam patterns extend in substantially the same direction.

7. Apparatus according to claim 6, wherein the microwave radiation has a predetermined frequency and the receivers are separated by a distance L/8, where L is the wavelength of the radiation.

8. Apparatus according to claim 5, wherein the beam patterns of the receivers are substantially parallel and the beam pattern of the transmitter is inclined with respect to the beam patterns of the receivers.

9. Apparatus according to claim 8, wherein the microwave radiation has a predetermined frequency, and the apparatus is constructed such that, in use, one of the receivers is a quarter wavelength closer to the surface than the other receiver.

10. Apparatus according to claim 5, wherein the transmitter and the receivers are mounted on an elongated support with the receivers adjacent to an end of the support and the transmitter spaced from the end of the support.

11. Apparatus according to claim 10, wherein the support comprises a rod, the transmitter and the first receiver are mounted on a same side of the rod and the second receiver is mounted on an opposite side of the rod,

and both receivers are the same distance from the transmitter.

12. Apparatus according to claim 11, wherein the apparatus is constructed such that, in use, the rod is oriented substantially perpendicularly to the surface, with the end of the rod adjacent to the surface.

13. Apparatus according to claim 12, wherein the rod has a handle constructed to permit an operator to hold the rod oriented substantially perpendicularly to the surface.

14. Apparatus according to claim 13, wherein the rod has an electronics unit mounted thereon that includes a source of radiation energy, a readout device, a power supply, and controls.

15. Apparatus according to claim 5, wherein the transmitter and the receivers are supported on an elongated rod with the receivers adjacent to an end of the rod and the transmitter spaced from the end of the rod, the transmitter and the receivers are disposed at a same side of the rod, and the apparatus is constructed such that, in

use, the receivers are adjacent to the surface, the transmitter is remote from the surface, and the rod is inclined to the surface.

16. Apparatus according to claim 15, wherein the rod has a handle and has an electronics unit thereon between the handle and the transmitter.

17. Apparatus according to claim 16, wherein the rod has a counter-weight adjacent to its opposite end.

18. Apparatus according to claim 17, wherein the electronics unit has a source of radiation energy, a readout device, and controls, and the counter-weight is part of a power supply for the apparatus.

19. A method of detecting a target hidden behind a surface, comprising:

transmitting, from a transmitting location, a beam of continuous-wave radiation through the surface toward the target;

receiving, at a first receiving location spaced from the transmitting location, reflected radiation from the target;

receiving, at a second receiving location spaced from the transmitting location and from the first receiving location, reflected radiation from the target; and

producing an output from combined signals derived from the reflected radiation at the first and second receiving locations, wherein

predetermined spatial relationships are provided between the transmitting location and each of the receiving locations and between each of the receiving locations, such that the phase of reflected radiation received at one of the receiving locations is in quadrature with the phase of reflected radiation received at the other receiving location.

20. A method according to claim 19, wherein the spatial relationships are such that direct radiation from the transmitting location is received at each of the receiving locations, and the phase of direct radiation received at one of the receiving locations is in quadrature

with the phase of direct radiation received at the other receiving location.

21. A method according to claim 19 or claim 20, wherein the output corresponds to the square root of the sum of the squares of signals derived from the receiving locations.

22. A method according to any one of claims 19 to 21, wherein the spatial relationships are such that one of the receiving locations is closer to the surface than the other receiving location and the transmitting location is farther from the surface than the receiving locations.

23. A method according to any one of claims 19 to 22, wherein the beams of radiation extend in substantially the same direction, the radiation is microwave radiation of a predetermined frequency, and the receiving locations are separated by a distance L/8, where L is the wavelength of the radiation.

24. A method according to any one of claims 19 to 22, wherein the radiation is microwave radiation of a

predetermined frequency that is transmitted by an antenna with a directional beam pattern, and the radiation received at the first and second receiving locations is received by antennas having directional beam patterns that are parallel to one another.

25. A method according to claim 24, wherein the beam pattern of the transmitting antenna is inclined with respect to the beam patterns of the receiving antennas.

26. A method according to claim 25, wherein the beam patterns of the receiving antennas are substantially perpendicular to the surface and one of the receiving locations is about a quarter wavelength closer to the surface than the other receiving location.